ARMY COMMUNICATOR

Voice of the Signal Regiment

ESB-E

Plus:

- *Project Warrior*
- *Near Pear Threats*
- *Large Scale Ground Combat Operations*

U.S. ARMY SIGNAL CORPS
FROM THE CIVIL WAR TO WINNING IN THE ERA OF GREAT POWER COMPETITION
1860 - 2020
160 YEARS OF EXCELLENCE

Contents

On the Cover

The 50th Expeditionary Signal Battalion-Enhanced used its new lighter tactical network equipment to provide network communications to the 1st Battalion, 7th Regiment, 108th Air Defense Artillery Brigade during a field exercise, at Fort Bragg, North Carolina.
Photo by Amy Walker

UNCLASSIFIED

Chief of Signal Regimental Team

Welcome to the March edition of the Communicator. Last month we discussed the way forward for big data. This month we will continue the trend of discussing where the regiment is heading by focusing on Expeditionary Signal Battalions-Enhanced (ESB-E). With the future being large scale combat operations and multi-domain operations, we need to be lighter, leaner, and faster. The conversion of ESBs to ESB-Es is exactly how we are making that happen. This concept was approved by the CSA in December 2019.

ESB-Es allow the Signal Corps to provide better capability in more quantities in support of the warfighter. We are reducing the overall size of an ESB-E, creating teams made up of only four personnel instead of the current nine man teams. This increases the number of command posts we can support by 63 percent while using state of the art equipment that is smaller, lighter, and more rapidly deployable. We will have teams that scale as mission dictates with tailored capabilities as required. With MOS convergence, our multi-functional, multi-disciplined Soldiers will thrive within these teams. This restructuring is allowing the regiment to re-invest cost savings and assets to fill critical gaps at echelon to support multi-domain operations. We are reshaping and revamping the way we get after communications and support the warfighter. Conversions of the first ESBs to ESB-Es will begin this fiscal year.

We, here in the Signal School, work for you every single day. Please let us know your thoughts and share with us all of your hard work. If you'd like to submit comments, photos, or have an idea for an article, please contact us.

Pro Patria Vigilans!

BG Christopher Eubank
Chief of Signal

CSM Richard Knott
Regimental CSM

CW5 Garth Hahn
Regimental CWO

Project Warrior

Nicholas Spinelli
Office Chief of Signal

For junior officers looking to gain crucial leadership skills for real-world situations, TRADOC offers Project Warrior. According to Army Human Resources Command (HRC), this four-year program Project Warrior was originally conceived in 1989 as a method of providing as close to possible practical battlefield experience to junior officers with leadership potential. The program went dormant in the early 2000's due to mission requirements; however, in 2013, then-Army Chief of Staff Gen. Ray Odierno re-established it.

"My intent in reinstituting Project Warrior is to infuse observations, insights, and lessons gained from multiple MCTC Decisive Action rotations against hybrid threats, back into the Force through the TRADOC CoEs," Odierno said at the time. While participating in Project Warrior, captains will serve for two years as an Observer-Coach-Trainer (OCT) at a Maneuver Combat Training Center (MCTC) followed by two years as a Small Group Leader (SGL), at a U.S. Training and Doctrine Command Center of Excellence, or TRADOC CoE.

"The schoolhouse has in the past taught what Signal leaders do but not necessarily proper methods of how it should be done," said Cpt. William VanArtsdalen, a Project Warrior participant currently serving as a Signal Cap-

SCCC students being given a tour of the Network Modernization facility. Photo by Cpt. Andy Chisholm.

tain's Career Course (SCCC) SGL. "Project Warrior program officers are on the front lines identifying gaps in junior officer operational understanding and drive the change needed in the operational and institutional domain through a unique purview that only the program provides."

Due to the strenuous workload and high expectations, failure to complete the program will not unfavorably impact performance evaluations, promotion potential, or future assignment consideration. Those that do complete the program, though, find the experience invaluable.

"I was very prepared for my current position due to my development as a Project Warrior officer," Maj. Kyle Barrett a former Project Warrior SCCC SGL and current Brigade Signal officer, said. "As a Maneuver BN OCT at JMRC, I gained a thorough understanding of the Signal systems and the Mission Command Warfighting Function, at Brigade and below, during Offense, Defense, and Stability Operations."

Participation in Project Warrior is highly competitive. In 2019, only nine junior Signal officers were chosen to join the program. According to HRC, "Qualified candidates must have completed Key Developmental (KD) requirements and attained a superior performance record. Participation in the program should not reduce the time spent in a KD assignment. Candidates must also possess superb training skills, coaching abilities, and tactical proficiencies."

In addition to these requirements, VanArtsdalen says perspective program participants also need something more.

"This program continues to require passionate Signal officers who truly care about the health of the branch and our ability to support the combined arms community to fight and win our nation's wars," he said.

For more information on Project Warrior, interested officers should contact their individual Assignment Officers. More information, including specific eligibility requirements and details of the application/selection process, can also be found in MILPER Message 19-208 (login required).
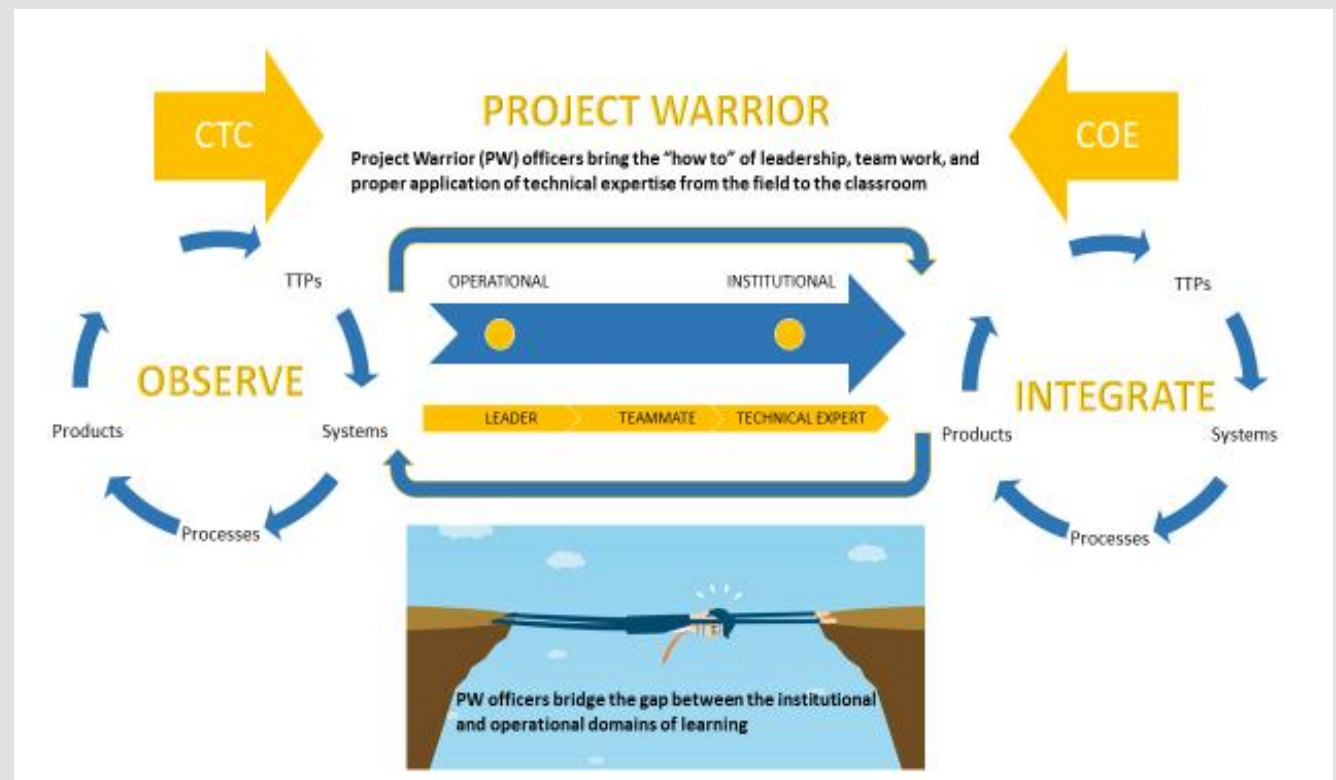
Graphic provided by Cpt. William VanArtsdalen

Building a Joint All Domain Operations capable force begins this year with the Expeditionary Signal Battalion-Enhanced conversions

Lt. Col.Kevin Weber and
Mr. Jonathan Long
Army Capabilities Manager Networks and Services

The Joint All Domain Operations (JADO) concept is driving efficiencies that include the integration of emerging technologies which enable the force to be more lethal, expeditionary, and integrated. The organizations and operations of our adversaries as well as our own, are continually evolving to meet future threats. Concurrently, emerging technology such as artificial intelligence, machine learning, and the proliferation of current technology such as drone and cyber technology to nation and non-nation state actors requires the Army Signal Corps to be agile and responsive to support the rapid and continuous integration of all domains of warfare in JADO.

Therefore, the Army requires an optimized signal force structure to provide commanders across all echelons secure, interoperable, common, and scalable network transport along with Department of Defense Information Network (DoDIN) operations to enable mission command network services ensuring the ability to gain and maintain the initiative across the competition continuum.

To enable successful expeditionary and Large Scale Combat Operations (LSCO) against a near peer adversary, the Army Signal Corps conducted a Signal End to End (SE2E) analysis which resulted is an optimized, agile, and scalable Signal force. The bedrock upon which SE2E rests is the Expeditionary Signal Battalion-Enhanced (ESB-E). The ESB-E is the output of five years of pilots, prototypes, and evaluations. By optimizing the ESB, the ESB-E structure and concept better enables SE2E forces to mutually support Signal capability and capacity at all warfighting echelons.

The ESB-E supports JADO, enabled by mission command, across echelons, through; expeditionary structure, secure tactical network transport, and
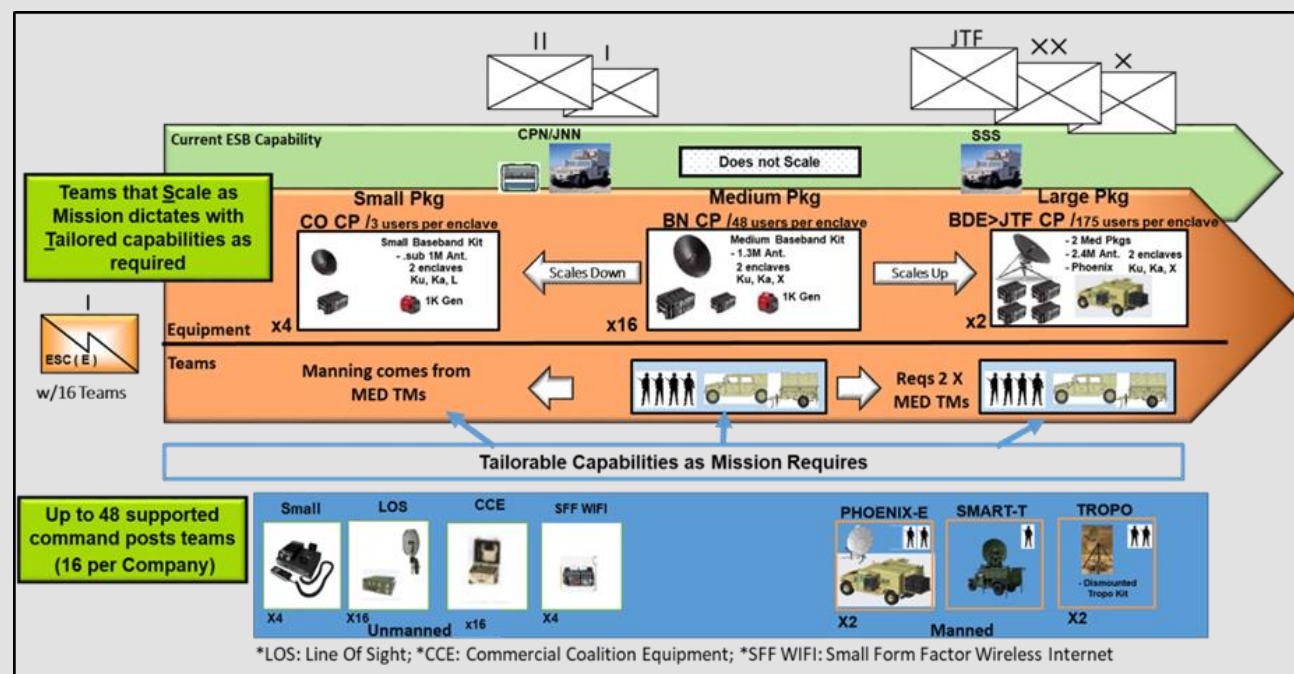
ESB-E Company Operational Concept
Courtesy Graphic

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DoDIN-Army operations. The ESB-E installs, operates, maintains, secures, and defends the DoDIN. The ESB-E provides the extension and reach back transport capabilities to provide access to joint communications and information systems and services to fight in a contested and congested environment. Using the Army Request For Forces (RFF) process, the ESB-E provides network support capabilities to command posts for units without organic network support (i.e., Joint Task Force (JTF) headquarters, Coalition/Joint Force Land Component Command (JFLCC) headquarters, Army Service Component Commands (ASCC), ASCC support commands, Functional Support Brigades) and based on mission requirements, augmentation to units with organic network support capabilities, i.e. Corps, Division, Multi-functional Brigades, and Brigade Combat Teams.

The current Expeditionary Signal Battalion (ESB) does not easily scale or tailor to meet the demands of JADO. The ESB-E is designed with scalable packages and tailorable capabilities to allow agile mission support. In Figure 1 the green bars shows current ESB capabilities, the top orange bar shows the small, medium, and large packages. The middle orange bar shows the four Soldier teams which are the cornerstone of the ESB-E capability. As requirements increase, teams and equipment can be added together to increase capability. The bottom blue bar shows the tailorable capabilities used to meet mission requirements. The left includes the un-manned capabilities and the right includes the capabilities with manned teams. Using this modular design facilitates efficient allocation and task organization of the battalion's resources to meet a broad range of network support missions.

A Soldier from the Army's new 50th Expeditionary Signal Battalion-Enhanced (ESB-E) pilot unit demonstrates the new scalable expeditionary tactical network equipment package during system demonstrations at Fort Bragg, N.C..

To enable effective communications and cross-domain synergy at the tactical edge, the Signal Regiment integrates the enterprise and deployable tactical capabilities to form a more flexible and resilient network environment enabling tactical warfighting with joint and coalition partners. The Integrated Tactical Network (ITN) and the Integrated Enterprise Network (IEN) are modernization efforts designed to establish the building blocks in order to unify the Army's network. The modernization efforts will integrate Army applications, services, and transport capabilities with interchangeable and upgradeable network components to form a more flexible and resilient network environment for the ESB-E and the warfighter to leverage.

The ESB-E concept of scalable and tailorable expeditionary capabilities is essential to support JADO capable forces. In alignment with this concept, the Army's Multi-Domain Task Force (MDTF) is currently modeling the organic MDTF signal company after the ESB-E company concept.

Training for Near Peer Threats

Sgt. 1st Class Steven Harvey
Cyber NCO Academy

The Army G2 Operational Environment team no longer designs multi-faceted operational environments for units. That responsibility has been given to unit staffs. Without a central expert source for this information, development of such products are a daunting task for inexperienced users. The 75th Ranger Regiment Training Brigade, the United States Army Sergeants Major Academy and the John F. Kennedy Special Warfare Center and School NCO Academy all utilize Army G2 Decisive Action Training Environment (DATE) products. Centers of Excellence with multiple MOSs and tiers may have not fully and wholly integrated Decisive Action Training Environment under one CAPSTONE where every MOS or branch is exercised simultaneously under a single Center of Excellence scenario. However, there are many school incorporations of the *DATE Caucasus*
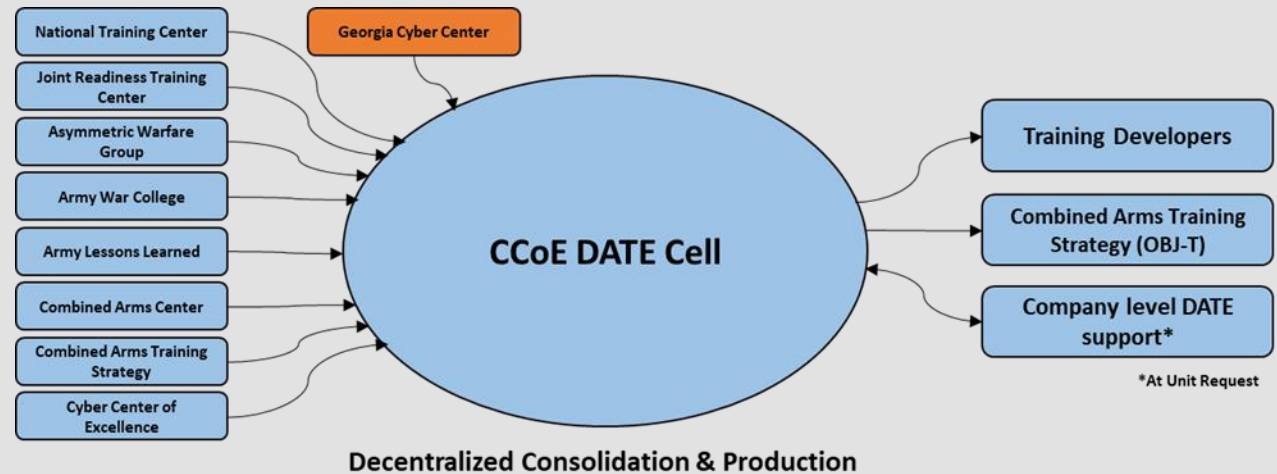
Graphic provided by Sgt. 1st Class Steven Harvey

Operational Environment within individual courses which fall underneath the larger Centers of Excellence such as the Infantry Basic Officer Leader Course (IBOLC), and Armor Basic Officer Leaders Course (ABOLC). The Exercise Design Tool, Imagery-Surveillance-Reconnaissance (ISR) capabilities, Information Operations Network, and other tools are expansive. Per TRADOC Regulation 350-50-3, the preferred base exercise for training to achieve the desired level of Phase I for Objective-T (PMESII-PT operational variables) is the Decisive Action Training Environment (DATE).

According to the Army G2 Mobile Training Team instructors, no Centers of Excellence have tackled unifying Decisive Action Training Environment training at both the institutional and unit level. The Cyber Center of Excellence should seize this opportunity and lead the way for other Centers of Excellence across the Army setting the example, providing support to the Signal school and Signal units at the operational level.

A dedicated team, the CCoE DATE Cell, would be responsible for creating near-peer focused operational environments for all institutional resident courses, Objective T scenarios for Brigade Combat Teams, Expeditionary Signal Battalions and other Signal elements, design custom training environments at

unit request utilizing the information operation networks. The team would also create crisis scenarios that promote critical thinking specific to both Cyber and Signal. Relying on individual training and development sections or unit staffs to provide this support expends more time and resources than is feasible and would ultimately result in a substandard product.

Institutions cannot target training shortfalls rapidly. With Cyber Center of Excellence Lesson Learned Forums, Council of Colonels, National Training Center, Joint Readiness Training Center, Asymmetric Warfare Group, Combined Arms Center and returning Signal units from deployments; guidance, trends, and feedback should be provided directly to this new section and training developers. The Cyber Center of Excellence could design an adaptable system where the most up to date trends and their solutions can be taught at the institution before leaders go on a rotation or deployment.

There are currently six different sections of training developers within the Cyber Center of Excellence and over two dozen individual courses, some of whom only have one training developer. As one of the NCOs tasked with implementing DATE into the CNCOA curriculum, we conducted six months of analysis reaching out to dozens of organizations across the Department of Defense from 12Y training developers (Geospatial), the National Geospatial-Intelligence Agency, Army G2 DATE team, Combined Arms Training Strategy team, Center for Army Lessons Learned, NTC Observer/Controllers and many more. They quickly realized to meet the intent; a similar method that cadets learn at Cadet Summer Training (CST) at Fort Knox, KY is required. Adding a scenario on top of a Practical Exercise in a course to pass certification misses the intent of the Decisive Action Training Environment.

The Decisive Action Training Environment process can be layered on top of the current curriculum using just one lesson plan. The core curriculum does not see any changes other than practical exercise information, imagery and the re-arranging of lesson plans to fit the roles for the pre-deployment. As technology advances and new equipment gets fielded, the Decisive Action Training Environment scenario is updated. As the Decisive Action Training Environment version and scenarios are updated the Programs of Instruction (POI) for courses will not need to be updated. The curriculum itself would remain the same unless there is a need for a POI change. The Decisive Action Training Environment version and scenarios are invisible to the POI. This method was designed to be flexible and transparent with little to no changes in how the process cur-
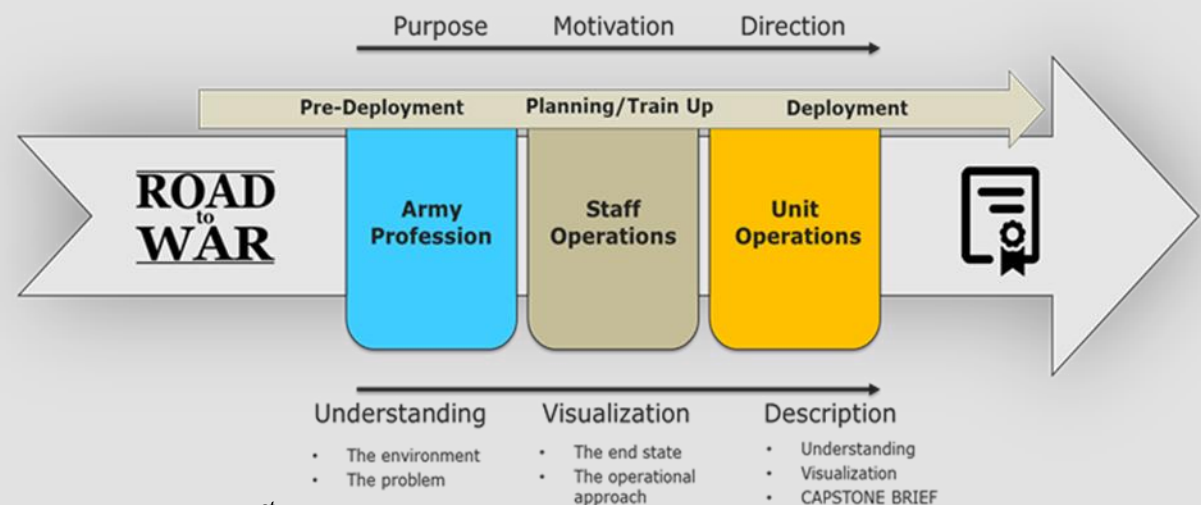
Graphic provided by Sgt. 1st Class Steven Harvey

rently works for training developers and instructors.

Analysis has shown that to effectively utilize the Decisive Action Training Environment at the institutional level, organizations need to change lesson delivery. The Non-Commissioned Officer Professional Development System (NCOPDS) currently teaches individual critical tasks (ICT) excluding the mandated, Leadership Core Competencies. Any topic outside of those tasks requires a Memorandum of Record.

Including Objective-T, as a unit level task in the POI and establishing a pre-deployment cycle before an end of course CAPSTONE that immerses students in the Decisive Action Training Environment, is neces-

sary. Objective-T is used by units to validate training using Training and Evaluation Outlines. As was stated earlier, Objective-T is in its infancy and Soldiers currently do not understand how to train it to standard.

Only three percent of NCOs surveyed in eight CNCOA end-of-course critiques across MOSs knew what Objective-T was and of those, none knew how to plan, grade or train for it. When describing Objective-T as crew drills or Signal gunnery the numbers increased slightly. Of those surveyed who knew what Objective-T was, all were in Expeditionary Signal Battalions (ESB). Training developers conducted surveys during the end of course critiques for MOSs 25W, 25N, 25Q and 25L. Questions were specific and targeted towards the Decisive Action Training Environment and Objective-T, given by NCO Academy training developers conducting the analysis.

This knowledge gap is critical. Army Doctrine Publication (ADP) 7–0, Army Doctrine Resource Publication (ADRP) 7–0, and Field Manual (FM) 7–0 provide the Army's doctrinal foundation for how units train to build training readiness. AR 350-1 Section III, Goals of Army Training and Leader Development, paragraph 1-8 states the unit commander has two major training responsibilities: prepare units to accomplish the mission and develop Soldiers/leaders for future responsibilities. The NCO Corps must be knowledgeable and ready to conduct Objective-T training.

Objective-T needs support from the NCO, Warrant Officer, and Officer schools to bring units up to speed doctrinally. Students need to learn how to plan, execute and evaluate Objective-T training. Once units have proficiency as observed at the National Training Center and Joint Readiness Training Center, priorities at the institutions can be changed based on Pareto's Efficiency and Cyber Center of Excellence guidance.

Pareto's Efficiency is the allocation of resources in which no other method or percentage of distribution is possible without taking those resources from somewhere else. Pareto's Efficiency works in all sectors of industry including education, economics, and engineering. Pareto's Law effectively states that on average 80 percent of effects come from 20 percent of the causes. Adapting Pareto's Efficiency and Pareto's Law into the curriculum using the Decisive Action
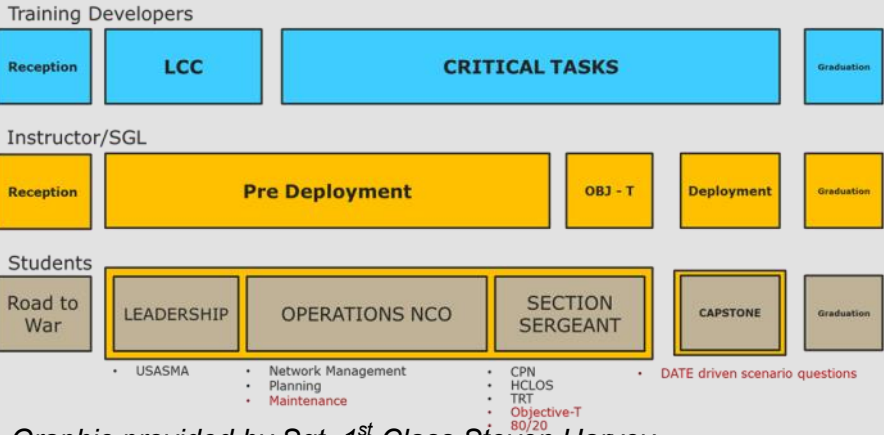
Graphic provided by Sgt. 1st Class Steven Harvey

Graphic provided by Sgt. 1ˢᵗ Class Steven Harvey

Training Environment has numerous advantages as the execution of such an initiative would raise the combat effectiveness across the force. Teaching every future leader who comes through Fort Gordon the most up to date lessons learned and training shortfalls directed by the Cyber Center of Excellence results in a flexible curriculum that can change as fast as the situation changes.

The ability to utilize Pareto's Efficiency and Pareto's Law within the curriculum to target training shortfalls observed at National Training Center, Joint Readiness Training Center, Asymmetric Warfare Group and

returning units from theater increase the Signal and Cyber Corps overall ability to perform their warfighting functions. Implementing these concepts requires every course to allow up to 20 percent of instruction time dedicated to subjects/unit level tasks outside their critical tasks or MOS.

Units across the Signal and Cyber Corps should to be utilizing the Decisive Action Training Environment for training. Units will benefit by having access to an organization that can provide training scenarios and tailors them to their unique needs. For example, Objective-T specific training that targets their Soldiers' proficiencies and scenarios for each Training and Evaluation Outline Report. This initiative focuses on Signal/Cyber Objective-T OEs and would provide scenarios for company level training. It would not be responsible for complete scenarios dedicated to Brigade Combat Teams, Divisions, or Corps. Expeditionary Signal Battalions have the Signal resources available to plan large training events. Signal Soldiers assigned to Brigade Combat Teams do not have this luxury. The DATE Cell will work with BCT Signal Company commanders if requested to meet their needs. The DATE Cell would have multiple products available online that Signal Companies can download to train Objective-T within an Operational Environment. Each Training and Evaluation Report would have multiple scenarios and Operational Environments for commanders to use.

For example, what are the standards for reacting to drone swarms in the Signal and Cyber fields? How are units monitoring and adapting to space weather when we know it can have deadly consequences? The 2002 battle of Takur Ghar in Afghanistan is an example of this. Scenarios would remain relevant, and up to date with ongoing revisions supported by the National Training Center, Joint Readiness Training Center, Asymmetric Warfare Group and other units' lessons learned with guidance from Cyber Center of Excellence.

Army Doctrine Reference Publication 6.0: Mission Command, defines mission command as the exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of unified land operations.

The DATE Cell tackles five of the six guiding principles of mission command, build a cohesive team through mutual trust, create a shared understanding, provide a clear commanders intent, exercise disciplined initiative and use mission orders. Providing DATE scenarios for Objective-T to become "Trained" or T builds our Signal teams at the unit level. At the institutions, through the changes

proposed to the curriculum, the classes must have mutual trust with one another to be successful during the CAPSTONE. The DATE Cell will create shared awareness across the force with up to date and relevant scenarios at the institutions and unit level if the commander requests that support. The scenarios built around identifying and executing the commanders intent at all levels, team leaders at their unit will have to exercise disciplined initiative to execute their orders to be successful.

To effectively plan for war and target threats we need a team consisting of individuals with experience and the ability to design scenarios that target training shortfalls and emerging threats. A DATE Cell dedicated to Decisive Action Training Environment development for the entire Cyber Center of Excellence is cost-efficient. An experienced field grade officer, chief warrant officer, and several senior enlisted NCOs who work in CMF 17 and CMF 25, and civilians to ensure continuity is the suggested manning. Workstations with access to NIPR on multi-display setups and office

space are the only requirements needed to produce products. Ideally, assigning the 2S ASI (Battle Staff) code for these TDA positions. Soldiers should attend the Mission Command Training Program or the five day Mission Command Exercise Planning course. Soldiers assigned to the DATE Cell could either go TDY enroute during their PCS or go TDY within six months of being assigned. These individuals need to be well versed in how unit staffs plan and operate.

Graphic provided by Sgt. 1st Class Steven Harvey

The DATE Cell is effectively designing war and providing units with entire operations consisting of operation orders, maps and scenarios down to the team level. The team directs how OPFOR operate, and which systems fail due to maintenance, hostile fire or operator error. The DATE Cell alleviates the burden placed on training developers and produces products that support AEAS 3 requirements for accreditation. It supports Signal Objective-T training requirements increasing readiness.

The DATE cell could increase in size to become a full-fledged organization. Assume for a moment this organization is called the Information Warfare Tactical Readiness Center (IWTRC). The IWTRC could be based on the Team of Teams concept, leveraging every readiness asset in the US Army creating "actionable" training. CALL, Asymetric Warfare Group, NTC, JRTC, US Army War College Excersice Design Team and even the TRADOC G2 OE team do not provide actual training products at scale. They all have very important roles and execute those roles exceptionally. Given access to the Wargaming Repository and other datasets, analytics could also be leveraged to support the Signal Soldiers with proper, fully realized near-peer scenario based training at home station, better preparing them for the real fight.
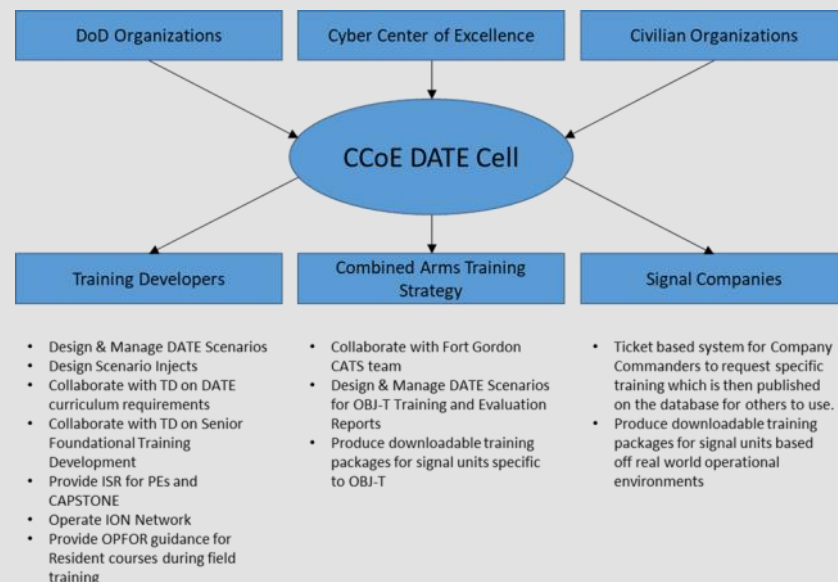
The Expeditionary Signal Battalion

A capability to meet the demands of Large Scale Ground Combat Operations

Col. Keith D. Hockman and
Lt. Col. Clifton D. Schmitt
Signal Organizational Integrator
and 62D Expeditionary Signal
Battalion

As the Army continues the pursuit of a competitive advantage through large-scale ground combat operations (LSGCO), our ability to make connections between doctrine, mission essential task lists, and training is extremely important. After all, LSGCO requires the convergence of combined arms effects at higher echelons against peer competitors. The US Army's most recent protracted conflicts have allowed the Army to develop proficiency in Counter-Insurgency, Counter-Terrorism, and Stability Operations. As these protracted conflicts continue, Army forces are employed at a smaller scale. Small scale employment has inherent constraints that often require non-standard mission sets for operations. Specifically, as the Signal Corps continues to play a role in a protracted conflict, a continued focus will remain on the employment of Signal enablers at the lowest team echelon. This is a result of a planning focus at the strategic and operational level of war with heavy consideration of manning levels and discrete rather than composite capabilities. As a result, the Signal capabilities that reside at the battalion and company echelons have become largely unconsidered. However, Expeditionary Signal Battalions are vital enablers to large scale, multi-domain operations because of the inherent capabilities associated with its current personnel and equipment organization combined with mission essential tasks at the battalion echelon. In order to better realize this capability in training scenarios and on future battlefields, there are three concepts that must be applied to the employment of Expeditionary Signal Battalions. Command relationships, task organization, and proficiency in mission essential tasks at the battalion and company echelons.

When ESB Company's or teams are employed in the absence of a Signal battalion (or brigade) a natural void is created in authority and direction for network operations. As a result, the authority for network operations at each echelon can become overly ambiguous at the Signal team echelon. There is often an attempt to fill this void by an S6 or G6 staff section. However,

An attached 62D Signal team arrives on a ridgeline during a BCT jump to setup LOS comms between the BEB and BCT CPNs at each TOC location.
Photo provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt.

the legitimate authority to functionally control theater network operations may not always reside with any particular commander's S6 or G6. ADP 6-0 defines mission command as the exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of unified land operations. This authority is essential for Department of Defense Information Network (DODIN) operations. The core purpose of the Army's Expeditionary Signal Battalions is to both plan and conduct DODIN operations. These operations are much broader than the localized DODIN operations responsibilities outlined in ATP 6-02.71, 30 April 2019 which pertains to G6 staff sections. At the theater level, the authority and direction (command and control) of DODIN operations resides in tactical and expeditionary Signal brigades and battalions.

Prevailing in large-scale ground combat operations (LSGCO) is one of the strategic roles of the Army that is supported by the central idea of multi-domain combined arms operations at echelons above brigade (EAB). The US Army Concept: Multi-Domain Combined Arms Operations at Echelons Above Brigade 2025-2045 describes this concept of employment. Success in these endeavors requires ownership of the network through effective command and control authority in order to best enable convergence of multi-domain effects across the battlefield. The Expeditionary Signal Battalion conducts network operations on cyber terrain in the cyberspace domain while also making efficient use of, and manipulating, the electromagnetic spectrum in the space domain. The Expeditionary Signal Battalion employs its organic systems physically on the land domain. The confluence of

Leaders on 62D teams discuss site improvement and security at the CSSB location. Photo provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt.

these three warfighting domains (land, space, and cyberspace) within Expeditionary Signal Battalions, make the ESB and its subordinate units key enablers in EAB multi-domain combined arms operations.

When the Expeditionary Signal Battalion is effectively employed in LSGCO, the battalion headquarters is best positioned to understand the friendly and enemy impacts on the network while also considering the geographic dispersion of all its Signal enabler teams within the ESB span of control. Through simple command and support relationships, the ESB is able to synthesize the fight and concept of operations within the deep, close, support, and consolidation areas for one or more of the Division, Corps, Field Army, and Theater Army echelons. In LSGCO, the ESB will employ Signal teams to units without organic signal assets for Division and Corps-level assets within their designated areas of operation. As a result, the ESB staff must understand the objectives in time and space within the deep, close, support, and consolidation areas that reside in

The A/62 JNN & CPN teams bury cable after rapid site occupation with the CSSB following a TOC jump. The Chief NTC Signal O/C noted that this was the best ESB team observed ISO of a CSSB.
Photo provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt

the overall areas of operation. By understanding these objectives, the ESB staff can effectively anticipate and plan DODIN operations as shifts and changes occur within the deep, close, support, and consolidation areas. Figure 1 provides a command relationship model for ESB employment in LSGCO. This model provides an additional method to address the TTSB and ESB command support relationship. The application of a C2 model such as this enhances the concepts described in ATP 6-02.71 for command relationships associated with DODIN operations. There are cascading advantages of these C2 relationships that provide simplicity and clarity to maximize network operations reporting efficiency. This facilitates rapid changes to the network based on METT-TC variables within the overall operation and increases network resilience based on cyber and EW considerations. The resulting advantage is the ability to leverage an unrealized cyber electromagnetic (CEMA) capability that already resides within the current composition of the ESB and its associated misA similar yet slightly modified C2 model was employed by the 62D ESB at the National Training Center in support of 52ID during a recent rotation as part of a home station opportunity training exercise. The 62D ESB established their NETOPS at Fort Hood, TX, providing C2 of their forward deployed company that was providing communications support to EAB assets executing operations at Fort Irwin, CA. The 52ID leveraged the 62D ESB HQ to control a large portion of the theater network with the 52ID area of operations. This enabled the 52ID G6 staff to more efficiently prioritize efforts across its BDEs. This is vital for EAB units with limited Signal capabilities. The 62D ESB engineered, installed, operated, maintained, and defended the network for Division assets and EAB units such as the combat sustainment support battalion (CSSB). The CSSB provided rear area support to multiple maneuver and functional BDEs. The ESB employed one of its organic Signal Company HQs under the tactical control (TACON) of

the CSSB given the operational environment. The 62D ESB HQ projected and defended its network assets in vicinity of Fort Irwin, CA while employing the BN TOC in vicinity of Fort Hood, TX. The 62D ESB established area security for the designated 62D ESB area of operations (network: spectrum transmission paths and cyber terrain). The amount of cyber terrain increased as EAB units connected users to the 62D ESB network. This increased the 62D

ESB's overall attack surface in the cyberspace domain. At the same time, the 62D ESB maintained an EMI vulnerability due open transmission paths and OPFOR assets. The 62D ESB HQs established layered security within its network area of operations and prepared for network defense in the event of an OPFOR cyberspace breach or electromagnetic disruption. The 62D ESB S3/S2 maintained continual assessment of potential OPFOR cyberspace avenues of approach into the 62D network along with OPFOR EMI capabilities. This included jamming threats and the 62D development of emission control

(EMCON) procedures. As the OPFOR attacked the network, 62D ESB directed network changes to maintain resilience while reporting and coordinating with 52ID for mobile cyberspace defensive assets on the network. These assets included specialty cyber teams external to the ESB. This training opportunity allowed the BN to focus on specific mission essential tasks while replicating LSGCO on a smaller, notional training scale. It also provided the company HQs with the opportunity to coordinate the operational impact of designated network changes with the supported units. This battle-focused training better prepared the BN for future LSGCO exercises in support of Component Commands and CCMD operations.

The A/62 JNN & CPN teams establish a hasty fighting position for integrated site security. The teams responded to a previous small arms attack resulting in 4 EKIA.
Photo provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt.

52ID was able to ingest and synthesize 62D ESB reports to the DIV NETOPS/CEMA Cell/G3 and G2 based on operational reports and or network anomalies that the 62D ESB observed or detected. The OPFOR employed network aggression against the 62D ESB who actively defended against malicious threat activity. The scope of these defensive actions translated into directives for DODIN operations that reinforced and strengthened the security of the network. 62D reported multiple cyber incident reports to the 52ID which were used to provide a shared understanding of network defensive operations at the DIV level. This is the first time that 52ID was able to integrate training with an ESB against a live network aggressor.

The current organization of ESB HQs contains the personnel with the specialties and the talent required for a network operations security center (NOSC). These personnel are trained with basic skillsets that are also desired in cyber electromagnetic activities (CEMA) cells. This blend of military occupational specialties includes Cyber Network Defenders, Incident Responders, Information Technology Specialists, Satellite Communications Operators, Intelligence Analyst, Transmission Systems Operators, Network Plans and Systems

Engineering Officers, Network Management and Information Services Technicians, and Theater Spectrum Managers. Additionally, the tools and equipment employed by these personnel in ESB HQs provide an array of optics for surveillance and security of the network. When an ESB HQs is effectively employed at echelon, a natural nexus of NOSC and CEMA capabilities can be leveraged to better enable cross-domain maneuver while maintaining an initiative within cyberspace and space domains. This requires the task organization of the ESB to be appropriately defined in a land component commander's overall command relationships within the theater of operations.

By clearly defining command relationships for the ESB within a designated theater of operations, the ESB can leverage assets within its task organization at the EAB level to provide inputs and outputs to CEMA decision cycles at the Corps, JTF, or LCC echelon and above. This also includes opportunities for immediate coordination with RCC in the event of any significant incidents. In order to take full advantage of ESB assets at the battalion echelon, the ESB must be positioned at the appropriate echelon within the C2 structure while fulfilling its role as a theater-level asset. This allows the ESB to make timely decisions for changes to the network as it plans and conducts DODIN operations. This provides improved situational awareness to the ESB's designated higher headquarters for better fidelity on theater-level DODIN operations. The higher headquarters may be TTSB or a TTSB serving as a CNOSC or JNCC. In the absence of a TTSB, the ESB's command relationship must be a higher level command that has authority for theater network operations.

The ESB is assigned a set of mission essential tasks (METs) at the battalion echelon. The major tasks include both planning and conducting DODIN operations. There are additional tasks at the collective, team, and individual level that support the major ESB tasks associated with functional DODIN operations. These sub-tasks are technical in nature and many of these sub-tasks are specific to cyberspace and electromagnetic considerations. The ESB must train and build proficiency on these sub-tasks in the ESB HQs and staff in order to truly command and control its network. This is vital for optimal DODIN operations at the theater level. When the ESB HQs is allocated at echelons above brigade and division, the ESB HQs has a vantage point for theater level visibility, aggregation, analysis, and response associated with CEMA and actions since many CEMA actions are inherent to DODIN operations.

Within the ESB, the METs at the company
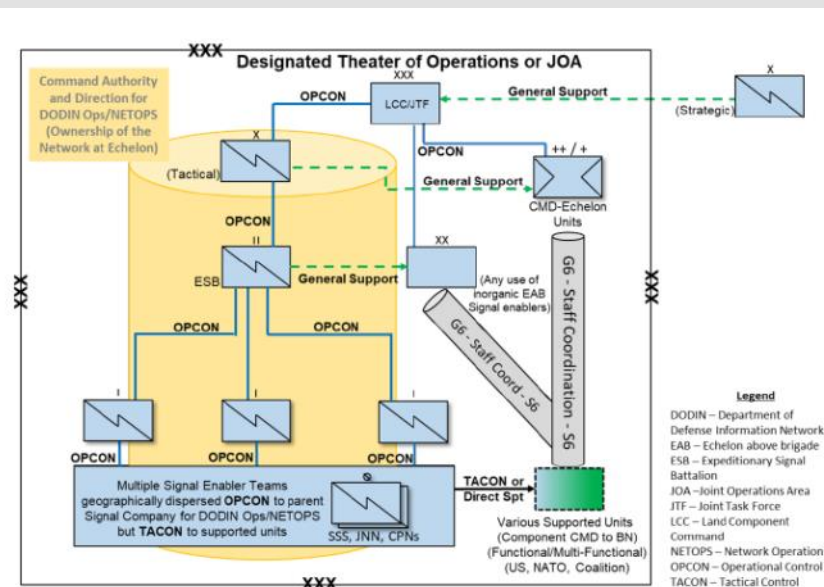
A Model for ESB Employment in LSGCO.
Graphic provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt.

echelon are different than the METs at the battalion echelon. The Expeditionary Signal Company (ESC) and the Joint Area Signal Company (JASC) level METs include a series of tasks associated with network switching and network transport. While the company level METs do not necessarily feed directly into the battalion METs, the ESB cannot perform its METs without a subordinate formation who can fully execute switching and transport tasks. Within ESBs, there is a great deal of emphasis and effort to resource and support
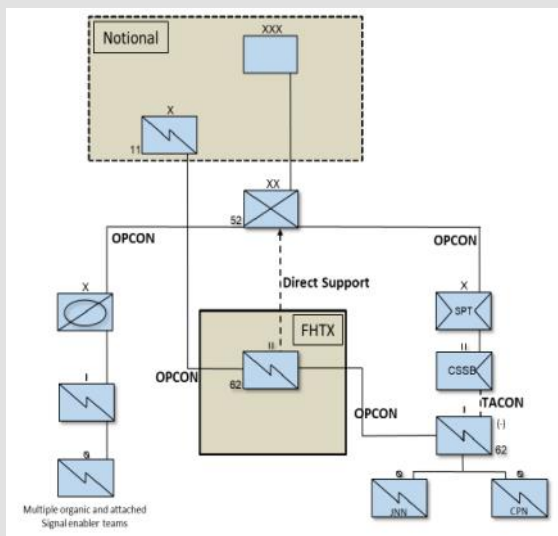
ESB Employment within a Division Area of Operations at NTC.
Graphic provided by Col. Keith D. Hockman and Lt. Col. Clifton D. Schmitt.

the signal node team chiefs. As a result, there are observable trends where heavy training effort flows from the battalion echelon directly to the team echelon. It is important for leaders to assess and taper these trends in order to mitigate atrophy in skills at the company, platoon, and section echelons. Additionally, if training gaps are routinely filled by the battalion echelon then the designated skillsets and collective MET proficiency at the battalion level are likely to diminish. Therefore, it is extremely important to resource and equip the company operations section in order to adequately reinforce training and skills at the platoon, section, and team levels. This naturally creates better command and control at the company echelon.

Within a LSGCO, an ESB can effectively command and control its subordinate ESCs while leveraging a trained and ready company operations section within each company command post. As nodal extension teams are geographically dispersed across the theater of operations, the ESB is best postured to execute its METs. As the ESB operates from its vantage point at echelon, there is greater fidelity of network information with increased situational awareness in the cyberspace and space domains. As the ESB staff combines its network information with its current and future assessments of ongoing operations in the land, air, and maritime domain, the efficiency of planning and conducting DODIN operations increases. As the ESB controls its portion of the theater network, the ESB is able to make decisions and changes while requesting any additional assistance from the higher headquarters as the ESB keeps them informed. As a result, the higher echelon TTSB, CNOSC, or CJNCC is better positioned to command and control the entire theater network. This is important since a LSGCO theater of operations will likely include multiple US and Coalition partner elements.

As our Army continues to build a competitive advantage in LSGCOs, expeditionary signal battalions must take part in every available training opportunity to operate at the appropriate echelon. As major commands, component commands, and Corps level headquarters to plan for ESB HQs in large operations and exercises, it will keep the ESB accountable to plan against mission requirements. The ESB HQs brings an additional set of capabilities that complement the efforts of Divisions, Corps, Component Commands, and Theater Armies. These capabilities are force multipliers in the cyberspace and space domains and enable overall CEMA efforts.

Army to begin modernizing signal battalions this summer

Col. Curtis Nowak and Col. Shane Taylor
Network-Cross Functional Team (N-CFT); Program Executive Office for Command, Control, Communications-Tactical (PEO C3T)

Following a successful and unique developmental pilot effort, the Army is on track to begin fielding a new tactical network communications package this summer that will modernize its 24 expeditionary signal battalions (ESBs).

The new ESB-Enhanced (ESB-E) tool suite is comprised of an innovative mix of smaller, more mobile tactical network transport equipment, with significantly reduced complexity and logistical requirements compared to that of legacy ESBs. The new commercial-off-the-shelf (COTS) equipment enables the ESB-Es to rapidly deploy and maneuver across the battlefield and provide robust and resilient network connectivity to the other units it supports.

The network equipment package provides multi-path signal diversity leveraging high-throughput line-of-sight and beyond-line-of-sight capability, replacing the ESBs larger legacy Tactical Network Transport At-The-Halt equipment (formally known as Warfighter Information Network-Tactical, or WIN-T). It is a critical component of the Army's Unified Net-

Soldiers from the 50th Expeditionary Signal Battalion-Enhanced set up a Micro-Very Small Aperture Terminal (VSAT) as part of their tactical network transport support to the 1st Theater Sustainment Command (TSC) Early Entry Command Post training exercise.
Photo courtesy of 1st TSC Public Affairs

work modernization initiative and is helping the Army deliver improved expeditionary, highly mobile network capability at echelons above brigade. The package is also tailorable and scalable to enable the new ESB-Es to support any sized unit across the entire operational spectrum, from forcible entry to a large Joint Task Force in support of Multi-Domain Operations.

Project Manager Tactical Network (PM TN) at the Program Executive Office for Command, Control and Communications-Tactical (PEO C3T); and the Network Cross Functional Team (N-CFT), worked together as a unified team with industry partners and the 50th ESB-E, 35th Theater Tactical Signal Brigade pilot unit, to rapidly deliver the right mix of capability at the best value.

Just one year after the Army approved the ESB-E pilot concept, PM TN completed fielding the 50th ESB-E's three companies with different sets of network equipment, so the team could use Soldier feedback to determine the best configuration to meet ESB modernization needs. The team leveraged informed experimentation in operational and lab environments, and continual Soldier input from training, field exercises, and real-world unit support, to inform decisions on capability, unit formation and tactics, techniques and procedures (TTPs). During the pilot, the 50th ESB-E successfully used the pilot equipment set to provide communications support during approximately 60 training exercises and real-world unit support in over 15 countries.

The ESB-E's new equipment is smaller, lighter, more agile, and expeditionary compared to legacy capability. Some of the equipment can even fit into the overhead of a commercial airline. Like the larger more traditional capabilities, these fully interoperable systems leverage the Army's Regional Hub Nodes and Global Agile Integrated Transport (GAIT) network design for worldwide data and mission command exchange. The initial ESB-E equipment package includes:

-Small, medium and large ground satellite dishes
-Network baseband equipment
-The high-throughput Terrestrial Line Of Sight (TRILOS) Radio
-Small Form Factor Secure Wireless
-Enhanced network operations tools
-Commercial Coalition Equipment

Because these systems are less complex, Soldiers can become proficient in multiple systems operations, enabling the ESB-E to reduce the size of the teams it sends out to support other units. The tool kit fully supports the new ESB-E organizational design, which calls for 16 four-Soldier command post teams per company, 48 teams per ESB-E, compared to 30 teams for legacy ESBs. The new formation design reduces personnel by nearly 20 percent.

The 50th Expeditionary Signal Battalion-Enhanced pilot unit demonstrated its new lighter, scalable, tailorable and more expeditionary network equipment prototype package to U.S. Army Forces Command leadership.
Photo by Amy Walker

while increasing the total number of command posts that can be supported by over 62 percent.

The Army will take a two-pronged approach to field the new equipment set and modernize the legacy ESBs. On the current plan, PM TN will field three ESB-Es per fiscal year. To get capability into the hands of Sol-

The ESB-E commercial-off-the-shelf tool suite will enable these signal units to rapidly deploy and maneuver across the battlefield and provide robust and resilient network connectivity to the other units it supports.
Photo by Amy Walker

diers as quickly as possible, the PM will field the first three battalions with the best capability, best value solutions selected from the ESB-E Pilot. Since each of the 50th ESB-E's companies had different prototype equipment sets for the pilot, this summer the PM will refresh the unit with the selected initial baseline equipment, and the 50th ESB-E will then be considered the first unit equipped. In addition, this summer, PM TN will field the 304th ESB, in Korea, turning that unit into the second ESB-E. Then in early fiscal year 2021, to accommodate the equipment procurement schedule, the PM will field a third unit, and that will complete the initial unit fielding.

Simultaneously, PM TN and N-CFT team will execute a second ESB-E acquisition and fielding approach to support the remainder of the ESB-E units, to ensure they procure the best enduring baseline solution solutions at the best value. The fielding of the second baseline equipment set is expected to begin in fiscal year 2021. As part of this agile acquisition and fielding approach, and in support of the Army's two-year network modernization Capability Set (CS) efforts, following an ESB-E baseline requests for information (RFI), qualified vendors will be invited to demonstrate their satellite terminal and/or baseband solutions, at Aberdeen Proving Ground, Maryland, in the spring of 2020. After which, PM TN will conduct quantitative analysis on lab-based assessments to verify capability and use a best value source selection to ensure the delivery of the right mix to the Army. This will be a cyclical plan that enables the Army to align with the Army's Capability Sets, increase competition for better value and capability, and enable market research RFIs, while saving time and resources for contract selections.

PM TN will continue to procure and field three kits per year until all of the ESBs have been upgraded to the new ESB-E baseline capability, which it expects in 2028. The agile acquisition and fielding approach enables the Army to enhance the baseline capability prior to 2028 if Soldier feedback warrants it or if evolving capabilities have matured enough to be procured, such as Medium Earth Orbit and Low Earth Orbit satellite capability.

The ESB-E pilot effort exemplifies the Army's new rapid acquisition paradigm and cross organizational teamwork. Rapid acquisition efforts such as these have become an essential element to the Army's continual efforts to retain technological dominance against advancing near peer adversaries.

A Century of Signal Corps Professional Journals

Steven J. Rauch
Signal Corps Branch Historian

On April 1, 1920 the Office of the Chief Signal Officer published *Information Bulletin No. 1*, an 18 page newsletter reproduced in mimeograph format. The announcement on the front cover stated:

"Hereafter there will be published by the Office of the Chief Signal Officer bimonthly bulletins of information….It is the belief of this Office that these publications will be the [way] of keeping all Signal Corps officers, both those on the active list and those on the inactive list, interested in their own particular branch of the service and the Army, and will also keep them informed of future plans of organization and training, development of Signal Corps methods and equipment, applications of lessons learned in the World War, and matters of general interest to the Signal Corps. This Office is desirous of obtaining and invites officers of the Signal Corps of the Regular Army and of the Reserve Corps to submit to this Office discussions, articles, letters and suggestions for publication in these bulletins."

The April 1920 edition of the *Information Bulletin* initiated a venue where members of the Signal Corps could have professional discussions about technical, tactical and administrative topics related to communications. The *Army Communicator* you are reading today is a direct descendant from the *Information Bulletin* as well as similar Signal Corps journals that have existed at various times during the past one hundred years.

The *Information Bulletin* was published from 1920 to 1940 in a 5x8 booklet or pamphlet for-
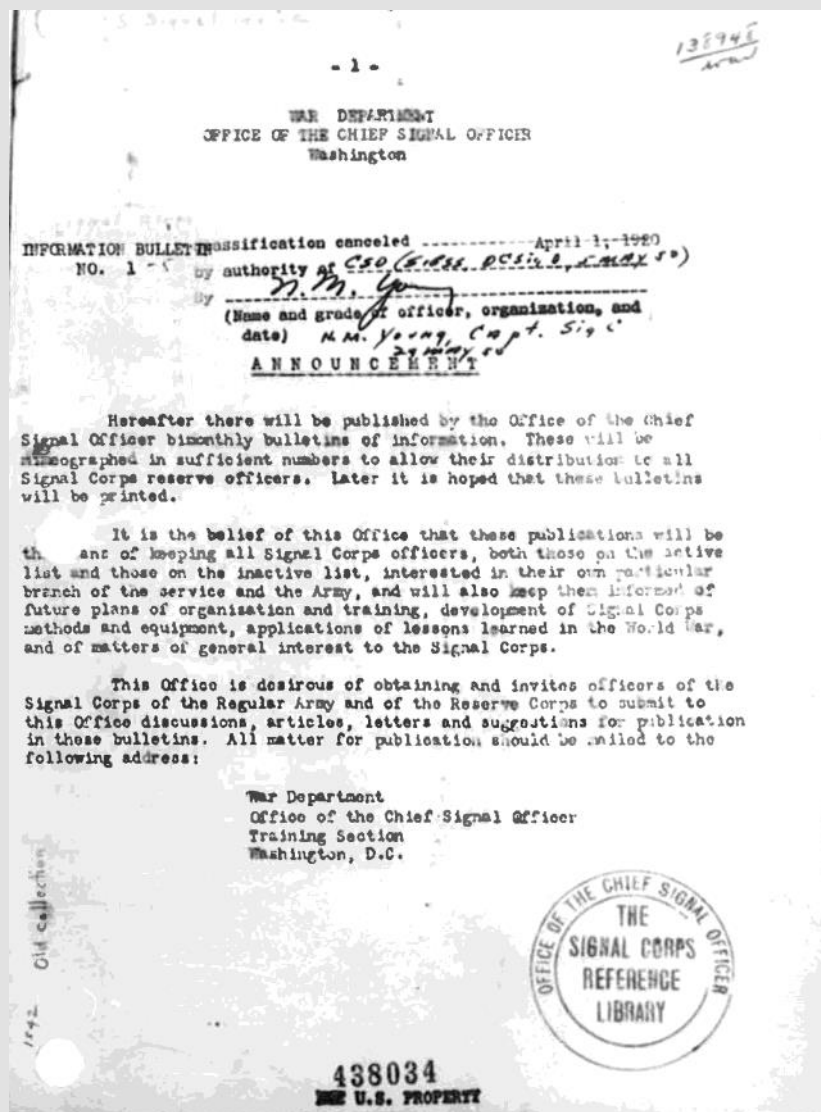
First issue of the Information Bulletin published by the Office of the Chief Signal Officer, April 1920.
Signal History Office Collection

mat. During its first few years the topics mainly focused on lessons learned about signal communications during World War I as well as trends in communications technology. As time went on, professional discussions centered upon organizing, equipping, training, and manning signal corps organizations and the challenges of future high speed, mechanized, advanced technology warfare.

In December 1941 as the nation expanded its military forces and moved towards a second world war, the *Information Bulletin* was replaced by a larger newsletter known at first simply as the *Information Letter*. As WWII progressed and the Signal Corps expanded into a world-wide force, the publication adopted the more formal name of *Signal Corps Technical Information Letter* (SCTIL) in December 1942 and was published monthly by the Office of the Chief Signal Officer. The *SCTIL* as it became known was the go to place for information about current operations and lessons learned in the various theaters of war. By August 1945 the *SCTIL* had grown to a 44-page, professionally printed and

THE
SIGNAL CORPS BULLETIN

▲

JULY-AUGUST 1933

WAR DEPARTMENT
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON, D.C.

LIBRARY
THE SIGNAL SCHOOL
FORT MONMOUTH, N. J.

Example of a later bulletin from the 1930s with a more regular and professional appearance.
Signal History Office Collection

No. 40

CONTROL APPROVAL
SYMBOL SPSAM-170

RESTRICTED

SIGNAL CORPS
Technical Information Letter

MARCH . 1945

ARMY SERVICE FORCES · OFFICE OF THE CHIEF SIGNAL OFFICER

Example of a WWII era Signal Corps Technical Information Letter, known as a SCTIL published between 1940 - 1945.
Signal History Office Collection

published magazine filled with snap-shots of various activities of the branch such as radio transmission security, signal assault planning, notes on equipment, notes on training and personnel. There was a specific warning however that "This publication is issued solely to give proper and speedy dissemination to timely, useful information concerning pertinent trends and developments.

Final issue of the 1950-1960's era TEC-TAC marking the reorganization and deletion of the Office of the Chief Signal Officer in 1962.
Signal History Office Collection

Nothing herein is to be construed as necessarily coinciding with United States Army doctrine."

The *SCTIL* ceased publication during the drawdown after the war. However in the early 1950s the Signal Corps found itself in a new war in Korea which prompted the revival of a professional journal entitled *Technical & Tactical Training Aid.* This new publication, later ab-

breviated to simply *Tec-Tac,* and was published with goals to provide a way to disseminate new ideas, lessons, and thoughts about the Signal Corps similar to the previous information letters and bulletins. *Tec-Tac* was published from April 1951 until December 1962 when a major Army reorganization affected the Signal Corps in many ways particularly the disestablishment of the Office of the Chief Signal Officer as well as the branch chief positions in all army branches. This disestablishment of a central office for the branch lead to a huge gap in responsibility for maintaining and publishing a branch professional journal.

During the 1960s and 1970s, Army communicators in Vietnam instituted a publication to fill that gap and continue professional discussion and sharing of new communication knowledge, tips, lessons learned and the like. The publication was called *Command Communications* was published monthly by the Assistant Chief of Staff, Communications-
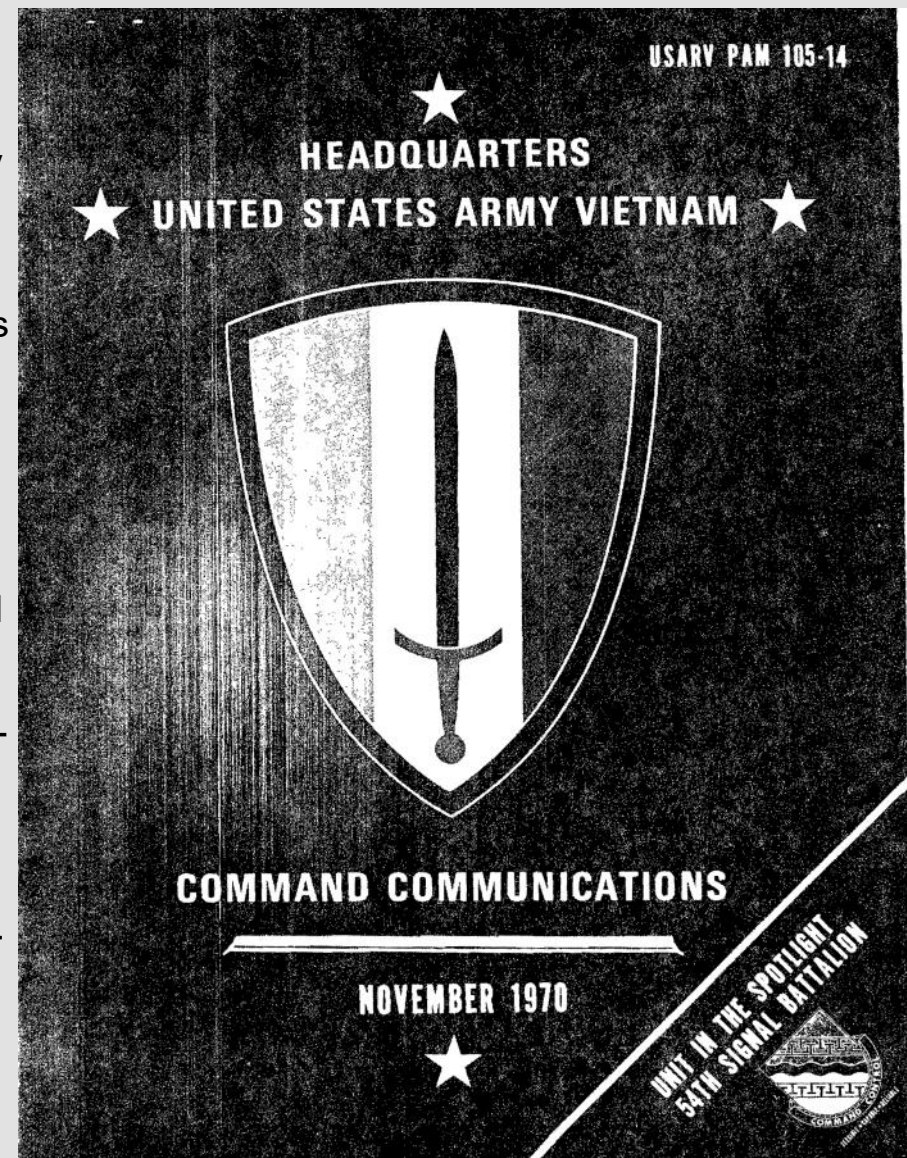
Example of the Vietnam War publication Command Communications published by the theater signal officers.
Signal History Office Collection

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY VIETNAM
APO SAN FRANCISCO 96375

AVHGG

All Commanders and Their Communicators
United States Army, Vietnam

US Field Commanders in Vietnam have a command and control capability never before available in military history due to the communications supplied by the signal units of our several Divisions and Field Forces along with the substantial support provided by the 1st Signal Brigade.

Signal unit personnel have built a proud tradition by responding to challenges at two levels. They are members of a combat team and help to plan and integrate communications so as to provide essential command and control. As specialized technicians, they know how to respond to the everchanging needs of the Field Commander. They are, in fact, soldier communicators.

As the Vietnam war draws nearer to a forseeable end, the tasks of Vietnamization and redeployment coupled with the overall mission of providing the Field Commander with responsive and reliable communications will make demands on the ingenuity, initiative and professionalism of the communications personnel.

This publication is designed to inform and assist you in expanding your professional knowledge to meet this challenge - - "Keep the Shooters Talking!"

HUGH F. FOSTER, JR.
Major General, US Army
Assistant Chief of Staff, C-E

Introduction page from a Command Communications issue emphasizing the importance of the Signal Corps.
Signal History Office Collection

Electronics, who served as the G6 for the United States Army Vietnam. This publication, as the others, encouraged the Signal Corps personnel to expand their professional knowledge to meet the challenges to "Keep the Shooters Talking!"

Following the Vietnam War, the US Army undertook major organizational change, one of which was to establish the Training and Doctrine Command (TRADOC) in 1973. Part of that reorganization was moving the Signal School from Fort Monmouth, NJ and consolidating it with the Southeastern Signal School campus at Fort Gordon, GA in 1974. During the consolidation and organization of the new Signal Center and School, the leaders decided to establish another professional journal. Several names were debated for a title - *US Army Signal School Magazine*, *Tactical Communications*, *Electronic Trends*, and several others were offered. Finally a decision was made and the name *The Army Communicator*, sometimes referred to as *TAC,* was adopted for the title. In the first winter 1976 edition a call went out to the Signal Corps for help in promoting the magazine and submitting articles of information for the branch as a whole. The editor stated:

"The Signal Corps, like other massive, far-flung organizations, needs a catalyst – a focal point to infuse into it a sense of unity and continuity…A forum – a place for expression and exchange of ideas - is essential to the progress and viability of any or-
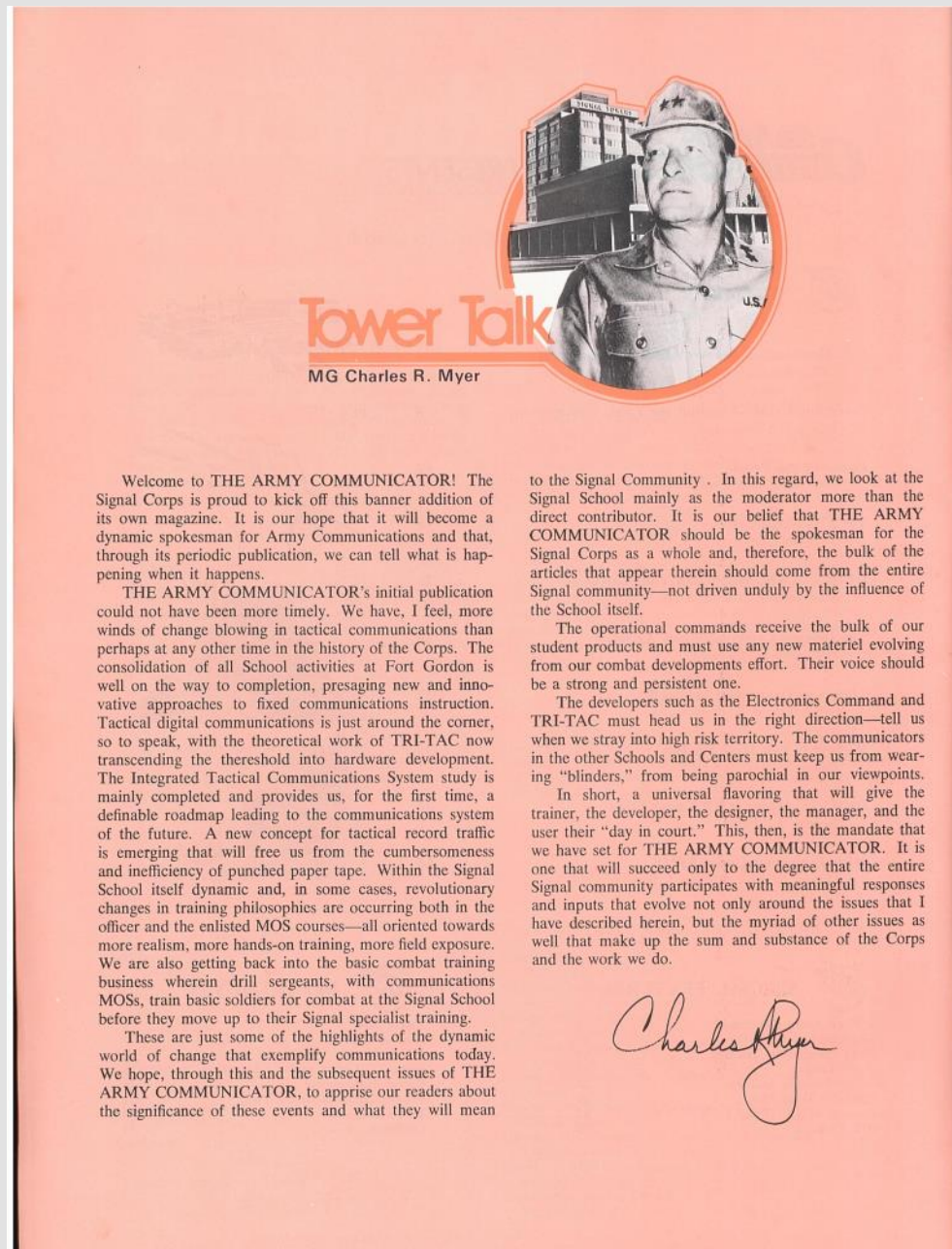
*ganization…We will indeed speak **of** the Corps, because that is our favorite subject. It is what we exist for. We will speak **to** the Corps, because we want to make better communicators and bring all signal types closer. Finally we want to speak **for** The Corps… The Army Communicator is your forum, educator, sources of C-E news, and a common bond among communicators.*

Cover of the 1st issue of The Army Communicator, Winter 1976. (Signal History Office Collection

A century ago in April 1920 as the Signal Corps was struggled to understand the recent past, the challenges of a dangerous present, and an uncertain future, the leaders saw a need for a forum in which to exchange ideas and share professional information. With the exception of a few years in the 2010s when resourcing issues caused a lapse in publication, the *Army Communicator* has continued that legacy from the first *Information Bulletin*, the *SCITL*, the *Tec-Tac*, and *Command Communications* as the forum for information and discussion for members of the US Army Signal Corps.

Tower Talk

MG Charles R. Myer

Welcome to THE ARMY COMMUNICATOR! The Signal Corps is proud to kick off this banner addition of its own magazine. It is our hope that it will become a dynamic spokesman for Army Communications and that, through its periodic publication, we can tell what is happening when it happens.

THE ARMY COMMUNICATOR's initial publication could not have been more timely. We have, I feel, more winds of change blowing in tactical communications than perhaps at any other time in the history of the Corps. The consolidation of all School activities at Fort Gordon is well on the way to completion, presaging new and innovative approaches to fixed communications instruction. Tactical digital communications is just around the corner, so to speak, with the theoretical work of TRI-TAC now transcending the threshold into hardware development. The Integrated Tactical Communications System study is mainly completed and provides us, for the first time, a definable roadmap leading to the communications system of the future. A new concept for tactical record traffic is emerging that will free us from the cumbersomeness and inefficiency of punched paper tape. Within the Signal School itself dynamic and, in some cases, revolutionary changes in training philosophies are occurring both in the officer and the enlisted MOS courses—all oriented towards more realism, more hands-on training, more field exposure. We are also getting back into the basic combat training business wherein drill sergeants, with communications MOSs, train basic soldiers for combat at the Signal School before they move up to their Signal specialist training.

These are just some of the highlights of the dynamic world of change that exemplify communications today. We hope, through this and the subsequent issues of THE ARMY COMMUNICATOR, to apprise our readers about the significance of these events and what they will mean to the Signal Community. In this regard, we look at the Signal School mainly as the moderator more than the direct contributor. It is our belief that THE ARMY COMMUNICATOR should be the spokesman for the Signal Corps as a whole and, therefore, the bulk of the articles that appear therein should come from the entire Signal community—not driven unduly by the influence of the School itself.

The operational commands receive the bulk of our student products and must use any new materiel evolving from our combat developments effort. Their voice should be a strong and persistent one.

The developers such as the Electronics Command and TRI-TAC must head us in the right direction—tell us when we stray into high risk territory. The communicators in the other Schools and Centers must keep us from wearing "blinders," from being parochial in our viewpoints.

In short, a universal flavoring that will give the trainer, the developer, the designer, the manager, and the user their "day in court." This, then, is the mandate that we have set for THE ARMY COMMUNICATOR. It is one that will succeed only to the degree that the entire Signal community participates with meaningful responses and inputs that evolve not only around the issues that I have described herein, but the myriad of other issues as well that make up the sum and substance of the Corps and the work we do.

Charles R. Myer

Editorial by Maj. Gen. Charles R. Myer, Commander US Army Signal Center & School in first issue of The Army Communicator. Signal History Office Collection